

who is a psychiatrist and prolific author of books and articles on psychopharmacology, used to prescribe Prozac happily. Like many clinicians, he was impressed: just one pill a day to bring a patient out of a wide variety of depressive complaints. Only with time did he realize that his patients were complaining of agitation and suicidal ideation. Then came that landmark trial in Louisville involving Wesbecker and Eli Lilly. The many expert witnesses revealed the alarming relationship between new brain science and the commercial goals and shortcuts of the pharmaceutical industry.

Healy's tale is complex and detailed, bringing together a huge amount of clinical-trial data and case histories. Ultimately, the book is about science, society and the power and misuse of commercial promotion. "We are facing a future of real biomedical developments," he concedes, but these are taking place in a world "in which corporate capacities to colonize the consciousness of citizens, physicians, regulators, and others outstrip their capacities to bring real benefits on stream". His investigation is impressive but is, in the final analysis, depressing, for he has no ready answers for the ills he describes. One can only hope that the benefits of commercially based psychopharmacology ultimately outstrip the catastrophes — but Healy is not prepared to concede such a conclusion. Perhaps our best hope is for vigilant and painstaking whistle-blowers, of which the authors of these two studies are formidable examples. ■

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The King of Siluria's journey

Murchison's *Wanderings in Russia*

edited by Michael Collie & John Diemer
British Geological Survey: 2004. 474 pp. £40
<http://www.bgs.ac.uk/bookshop>

Ralph O'Connor

If you had been rowing across the Volga near Kazan, western Russia, in May 1841, you might have been startled by the sound of raucous singing:

*Ah, the red sandstone! How bored am I!
I'd very well pay a thousand louis
Never again in my life to see
The new red sandstone of Tartary!*

The singer (and composer) was Roderick Murchison, the greatest practical geologist of



Geologist Roderick Murchison studied the gorge of the River Chusovaya on his travels through Russia.

his day and a key player in Queen Victoria's empire. In their search for mineral resources, Britons of the time were organizing and stamping their authority on landscapes past and present, naming periods such as the Cambrian, Silurian and Devonian after British localities and peoples. Strata had become the central concern of geology, not so much for telling the story of life — though this was a good way of selling books — as for mapping the positions of rocks and correlating them across the globe.

Murchison had become famous in the 1830s as the man who made sense of the earliest Palaeozoic strata in the Welsh borders. He now meant to give his 'Silurian system' a global reach. In 1840 and 1841, Murchison and three colleagues sped across the Russian plains, covering thousands of miles and adding new territories both to his geological empire and to the Tsar's coal reserves. Such an exhausting and exhaustive campaign naturally had its dull moments, hence the song quoted above.

His findings were written up in the hefty *Geology of Russia* (1845), and the honours he had craved since he abandoned his military career at last poured in — he was hailed as the 'King of Siluria' and as the Copernicus of the age. But intellectual ossification was quick to follow: from this point on he knew he was right, and cultivated the impenetrable formality of the retired general.

Murchison also wrote up his travels in a less formal manner. His journal, *Wanderings in Russia*, provides a continuous narrative of his 1840 and 1841 expeditions, and is here published for the first time. This handsomely produced book should be welcomed by historians and geologists alike. It is full of fascinating anecdotes about local customs, manners and rocks from St Petersburg to the

Urals. Social commentary was not Murchison's forte, but in his clipped way he provides a rich mine of specific information about the land through which he was travelling.

As a travel writer, Murchison cannot compare with his fellow geologist and Scotsman, Hugh Miller, whose marvellous Hebridean travelogue *The Cruise of the Betsey* (1845–49) has also recently been reprinted (see *Nature* 426, 19; 2003). Where Miller has the novelist's gift for character and incident, Murchison just rambles on. But once you get used to the amoebic shape of the narrative and its periodic outbursts of self-congratulation, *Wanderings in Russia* is an enjoyable read, full of humour as well as picturesque description. If is, of course, highly revealing of Murchison's own attitudes, including his affection for the Russians at a time when British 'Russophobia' was on the rise.

Michael Collie and John Diemer have done a splendid job of editing this massive text, helpfully splitting it into short sections and inserting a running commentary, with detailed maps and notes. The full-size colour reproduction of the *Geology of Russia*'s enormous geological map, tucked conveniently into a pocket at the back, deserves special praise. My only reservations concern the rather short introduction, which, despite many useful insights, is too involved in minutiae to give the general reader much of a foothold. Too much time is spent worrying about Murchison's political incorrectness, and the editors refuse point-blank to discuss his "supposed imperialism" (as if that were ever in doubt), although this aspect of his career has recently excited more interest than any other.

The bibliography has some striking omissions, in particular James A. Secord's

ground-breaking article "King of Siluria" in *Victorian Studies* 25 (1981–82) and his subsequent book *Controversy in Victorian Geology* (Princeton University Press, 1986), and Robert Stafford's book *Scientist of Empire* (Cambridge University Press, 1990). Along with the work of Martin Rudwick, these studies provide the historical context lacking in Collie and Diemer's introduction.

But it is by the text itself that such a book stands or falls. For making this important narrative available in such an attractive and (for its quality) inexpensive format, the editors are to be congratulated. ■

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Theatre

Playing dirty

Calculus

Written by Carl Djerassi

Performed at the New End Theatre, London, until 28 August 2004

Philip Ball

We don't generally expect our geniuses to be genial, but few are as downright misanthropic as the version of Isaac Newton now in vogue in science histories. He is the villain in Lisa Jardine's *The Curious Life of Robert Hooke* (HarperCollins, 2003) who

tried to more or less erase the hapless Hooke from history. He is an elusive, forbidding presence in James Gleick's popular recent biography *Isaac Newton* (Pantheon, 2003). And Stephen Hawking, who now occupies Newton's chair at Cambridge, has accused him of being vindictive, arrogant and prone to petty arguments.

In Carl Djerassi's new play, *Calculus*, Newton appears just once — as a monster who browbeats Queen Anne's physician John Arbuthnot with furious silences. But this may not be the real Newton after all: his appearance features in a play within a play, written by architect John Vanbrugh and theatre manager Colley Cibber to reveal the 'truth' about Newton's dealings with the Royal Society in his dispute with Gottfried Wilhelm Leibniz.

Djerassi has used this device before in his play *Oxygen* (2001), which was also about priority disputes in the history of science. It is a useful way of dealing with the complexities of the issues. It allows Cibber to anticipate the audience's dismay (and indeed I sensed such a response) at having to hear about the calculus, the mathematical technique devised independently by Newton and Leibniz. It also lets Cibber and Vanbrugh impersonate the two protagonists as they argue over the details. The problem is that Arbuthnot's final revelation to Cibber about the source of his play's material forces us to doubt whether what we have just witnessed is any reflection of what really transpired when the Royal Society was called upon to adjudicate in the dispute.

Ultimately, however, *Calculus* struggles with the fact that there is just not quite enough at stake here to sustain the drama. The dialogue is crisp and the staging attractive, but the central event — Newton's manipulation of the Royal Society — is not inherently theatrical and does not generate sufficient tension. (I did, however, enjoy the portrayal of the eminent French mathematician Abraham De Moivre as a gluttonous reprobate.)

Newton called his version of the differential calculus 'fluxions'. He developed it in the 1660s, when he was in his twenties, but like so much of his work, he declined to publish it until it seeped out in the first version of the *Principia* in 1687. But when Leibniz visited London in 1673, it became clear to Henry Oldenburg, secretary of the Royal Society, that trouble lay ahead, for the German mathematician had devised a similar method. Newton was persuaded to write to Leibniz in 1676 to point out his prior work, and although the two men corresponded amiably enough for the next year, they reached no agreement. Leibniz published his own version of the calculus in 1684, but it was not until 1699 that the real arguments began. That was when Newton's friend Fatio de Duillier more or less accused Leibniz of plagiarism.

Djerassi wisely avoids trying to resolve this dispute. Rather, his play centres on the deliberations of a Royal Society committee appointed in 1712 to pronounce on the priority issue. Newton was the society's president at the time, so it was no surprise that most of the committee's 11 members were his supporters. But he took no chances, drafting the committee's report himself (it stated that "we reckon Mr Newton the first inventor" of the calculus) and simply presenting it to them for signing. They duly approved it, and Newton stepped in again to take care of the printing. Leibniz knew nothing of the process until the declaration was distributed to scholars all over Europe.

It was surely one of Newton's most deplorable acts. Djerassi looks at the ways that the committee members wrestled with their consciences, and at how considerations of nationalism, religion and personal politics coloured their behaviour. But in the end, the play's broader question is about scientific reputation: is it better to reveal science's shameful secrets or to preserve its appearance of authority? Djerassi says that he was himself accused of "washing dirty lab coats in public" after writing his earlier fictional books on scientific research. Mercifully we no longer seem compelled to sanitize the history and sociology of science in the way that David Brewster did with his 1831 hagiography of Newton, in which he meticulously excised all mention of the great man's interests in alchemy and astrology. ■

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A play within a play: Colley Cibber and John Vanbrugh make a point about Newton in *Calculus*.